TABLE 2.—*Monthly and annual precipitation (inches)*—Continued

	January	February	March	April	May	June	July	August	September	October	November	December	Annual
SANTA ANA—Continued													
1921	0.0	0.0	0.70	0.0	0.80	9.37	3.05	9.54	6.55	7.09	0.0	0.71	85.83
	0.0	0.0	0.0	0.0	3.12	8.55	3.76	4.11	12.91	14.65	0.92	0.0	
1922	0.0	0.0	0.0	(2)	0.0	13.20	3.96	7.45	8.32	4.39	1.22	0.0	(2)
	0.0	0.0	0.0	(2)	5.57	4.22	4.42	13.08	7.65	1.27	1.51	0.0	(2)
1923	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	1.70	7.52	0.0	0.0	(2)
	(2)	(2)	(2)	(2)	(2)	(2)	(2)	0.57	3.85	0.75	0.0	0.0	(2)
1927	(2)	(2)	(2)	(2)	15.50	13.50	16.20	9.40	14.40	6.30	0.0	(2)	75.3
1928	(2)	(2)	(2)	0.70	11.30	15.50	11.40	14.00	10.40	6.20	3.30	(2)	73.90
1929	(2)	(2)	(2)	1.70	8.20	10.00	12.60	9.30	15.00	12.20	0.0	(2)	69.00
1930	(2)	(2)	(2)	4.00	8.40	13.20	11.80	(2)	(2)	(2)	(2)	(2)	(2)
Mean	0.12	0.03	0.10	1.44	7.47	11.97	10.18	11.09	12.36	8.26	0.85	0.18	65.93
Maximum	0.80	0.26	0.70	7.23	15.50	17.92	20.62	20.53	19.46	21.74	3.30	0.83	85.83
Minimum	0.0	0.0	0.0	0.0	3.92	4.51	5.82	6.89	5.55	3.98	0.0	0.0	60.80
SOYAPANGO													
1926	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	17.50	8.90	0.70	(2)	(2)
1927	(2)	(2)	(2)	0.0	0.0	23.20	20.00	24.30	21.90	27.50	0.0	(2)	116.90
1928	(2)	(2)	(2)	0.50	8.50	25.10	19.70	0.0	38.60	16.80	6.30	(2)	115.50
1929	(2)	(2)	(2)	0.0	7.00	13.90	12.60	12.90	19.60	13.10	5.10	(2)	84.20
1930	(2)	(2)	(2)	1.30	7.10	11.30	6.10	(2)	(2)	(2)	(2)	(2)	(2)
Mean	(2)	(2)	(2)	0.60	7.52	19.37	14.60	12.40	24.40	16.39	3.00	(2)	95.28
Maximum	(2)	(2)	(2)	1.30	8.50	25.10	20.00	24.30	38.60	27.50	6.30	(2)	116.90
Minimum	(2)	(2)	(2)	0.0	0.0	11.30	6.10	0.0	17.50	8.90	0.0	(2)	84.20
TEXIZ JUNCTION													
1928	(2)	(2)	(2)	3.40	0.0	18.0	9.30	17.50	7.40	0.0	4.40	(2)	60.00
1929	(2)	(2)	(2)	3.20	3.40	11.40	5.30	3.50	14.50	3.00	0.0	(2)	44.30
1930	(2)	(2)	(2)	0.0	1.60	7.70	6.30	(2)	(2)	(2)	(2)	(2)	(2)
Mean	(2)	(2)	(2)	2.20	1.66	12.76	6.96	10.50	10.95	1.50	2.20	(2)	48.33
Maximum	(2)	(2)	(2)	3.40	3.40	18.00	9.30	17.50	14.50	3.00	4.40	(2)	60.00
Minimum	(2)	(2)	(2)	0.0	0.0	7.70	5.30	3.50	7.40	0.0	0.0	(2)	44.30
USULUTAN													
1924	(2)	(2)	(2)	(2)	0.83	19.97	17.01	18.56	14.04	8.35	0.0	(2)	(2)
1925	(2)	(2)	(2)	10.98	5.05	8.14	9.26	6.19	21.03	13.15	4.05	(2)	77.85
1926	(2)	(2)	(2)	0.0	3.30	13.70	9.03	22.20	21.70	14.06	0.40	(2)	84.39
1927	(2)	(2)	(2)	0.0	23.50	22.20	12.20	16.90	12.60	12.10	0.0	(2)	99.50
1928	(2)	(2)	(2)	0.60	8.60	15.40	6.30	14.10	17.00	5.40	7.20	(2)	74.60
1929	(2)	(2)	(2)	1.10	9.60	9.30	9.70	10.50	14.80	21.30	2.30	(2)	78.60
1930	(2)	(2)	(2)	0.0	6.10	4.20	5.20	(2)	(2)	(2)	(2)	(2)	(2)
Mean	(2)	(2)	(2)	2.53	8.14	13.27	9.81	14.74	16.86	12.39	2.62	(2)	80.36
Maximum	(2)	(2)	(2)	10.98	23.50	22.20	17.01	22.20	21.70	21.30	7.20	(2)	99.50
Minimum	(2)	(2)	(2)	0.0	0.83	4.20	5.20	6.19	12.60	5.40	0.0	(2)	74.60
ZACATECOLUCA													
1924	(2)	(2)	(2)	(2)	2.70	19.70	23.20	17.70	20.50	15.98	0.0	(2)	(2)
1925	(2)	(2)	(2)	3.28	8.71	11.68	13.42	9.37	9.79	9.74	2.97	(2)	68.96
1926	(2)	(2)	(2)	0.0	7.09	14.42	15.27	25.86	19.77	17.55	0.0	(2)	99.96
1927	(2)	(2)	(2)	0.0	13.60	12.80	4.80	26.80	13.40	11.90	0.0	(2)	83.30
1928	(2)	(2)	(2)	2.00	10.20	19.30	13.40	17.70	26.20	9.10	3.50	(2)	101.40
1929	(2)	(2)	(2)	0.0	10.00	19.30	11.60	15.50	23.60	18.60	0.0	(2)	98.60
1930	(2)	(2)	(2)	2.40	3.20	15.20	7.70	(2)	(2)	(2)	(2)	(2)	(2)
Mean	(2)	(2)	(2)	1.28	7.92	16.05	12.77	18.82	18.87	13.81	1.07	(2)	90.59
Maximum	(2)	(2)	(2)	3.28	13.60	19.70	23.20	26.80	26.20	18.60	3.50	(2)	101.40
Minimum	(2)	(2)	(2)	0.0	2.70	11.68	4.80	9.37	9.79	9.10	0.0	(2)	68.96

[2] No data.

NOTES, ABSTRACTS, AND REVIEWS

Glaze storm in South Dakota, November 18 to 20, 1930, by M. E. Blystone.—The glaze storm of November 19 to 20, 1930, extended from Charles Mix and Gregory Counties, S. Dak., northward to Edmunds County, and from Edmunds, Faulk, and northern Hand Counties eastward to the border of the State. It occurred during the passage of a cyclone of great intensity from Texas northeastward across the western slope of the Mississippi Basin. Within the area indicated the temperature was near, or slightly below, the freezing point, and the precipitation occurred mostly in the form of rain. The rain froze on electric wires, trees, etc., forming cylinders of ice which, in many instances, are reported to have been an inch or more in diameter. The weight of the ice, together with the rather high wind that attended the storm, caused wires and large numbers of poles to be broken down. Trees, also, were broken down, but the main damage was to electric lines. The damage from this storm is estimated to be from $400,000 to $500,000. It is generally believed that this was the most destructive glaze storm in the history of South Dakota. However, the great increase in the mileage of electric lines in recent years has greatly increased the possibilities of destruction by such a storm.

The width of the zone within which the glaze storm occurred is from 30 to 60 miles. To the north and west of this zone the precipitation was in the form of snow. While to the south and east of the two wings of the glaze storm area the precipitation was in the form of rain, the temperature there was not low enough to cause the rain to freeze on the surfaces on which it fell.

The glaze storm of November 15 to 16, 1930, in North Dakota and Minnesota, by R. J. McClurg.—On Friday evening November 14, 1930 at 7:09 p. m. a fine misting rain began to fall in the Fargo-Moorhead area. This mist continued throughout Friday night, Saturday, and a portion of Saturday night. A very light north and northwest wind accompanied it. The temperature fell to 31° about 9 a. m. Saturday causing the rain to freeze as it came in contact with any object, except the sidewalks and paved streets. It formed glaze on the ground, trees, telegraph and telephone wires, and on buildings. Early Sunday morning the mist turned to a moderate rain continuing until 5:40 p. m., when it turned to sleet until 5:46 p. m., then turning to snow. The glaze kept increasing throughout Saturday night and Sunday forenoon.

At 12 noon Sunday ordinary uninsulated telephone wires were coated with glaze from one-half to five-eighths inch in diameter. The ice was much thicker on the top and north side of the wires. Icicles from 3 to 4 inches long hung from the wires, with 8 or 9 icicles per foot. On Monday, November 17, when the sun broke through the clouds, the entire landscape presented a glittering aspect. The trees were especially beautiful with every twig covered with ice and sparkling in the sunlight.

It seems incongruous that a storm could produce so much beauty, and yet be so destructive. It was estimated that a main toll line of 60 wires in Moorhead carried a weight of over 2 tons of ice from pole to pole, a distance of 132 feet. From reliable reports this storm was confined mostly to the Red River Valley north of Moorhead, covering an area of about 40 miles in width and 100 miles in length.

The toll line mentioned in the above paragraph was a complete loss for one-half mile, due to the breaking of the poles under the great strain. The Northwestern Bell Telephone Co. estimate their loss at $40,000; this does not include loss of revenue. The Western Union Telegraph Co. estimate their loss to the communication lines at $5,000; the loss of revenue not estimated. The Great Northern Railway Co. estimate their loss at $2,000, and the Northern Pacific Railway Co. estimate their loss at $1,500. The damage to the Moorhead municipal light and power lines was estimated at $100 by the breaking of several poles and wires. The damage to trees in this area can not be estimated, but undoubtedly it will be great, because in so many places branches up to 4 inches in diameter were snapped off under the weight of the ice.

The absence of strong winds with the unusually low barometric pressure during this storm lessened the loss immensely. A storm of this nature is very unusual for this section of the country, so is of great interest from a meteorological viewpoint.

The glaze storm of the 19th and 20th which occurred west and south of this station caused greater damage than the one above-described; at this writing (November 24) communication lines are still out of order.

Note on the effect of a lightning bolt (by *A. G. Simson*).—The effect of a lightning bolt striking an air-tight cylinder may be of interest to some of the students of lightning behavior. The cylinder, which was of about 18-gage nickel-plated brass, measured 4 by 22 centimeters, had been partially buried in the scanty soil on the topmost pinnacle of Three Fingered Jack, a mountain peak in central Oregon. It lay in approximately the position shown in Figure 1. The tube had been placed there as a receptacle for the register of the names of a party of hardy souls who had scaled that difficult peak.

Assuming, in order to simplify the explanation, that the lightning was from cloud to earth, it appears that the bolt entered the tube at the point A, burning a hole 6 by 18 millimeters, having an area of approximately 105 square millimeters. Three points of exit are indicated, B, C, and D. B is a large oval hole 14 by 21 millimeters, of area 240 square millimeters, and C and D are blisters 5 millimeters in diameter on the surface of the metal. (See fig. 1.) There were no evidences of pressure, internal or external, against the walls of the cylinder. Unfortunately there is no information available as to whether or not the lightning destroyed the sheet of paper contained in the tube at the time it was struck.

The condition of the cylinder after the bolt had struck it is altogether unlike that of the tube described and illustrated by Professor Humphreys, Physics of the Air (pp. 391–396).

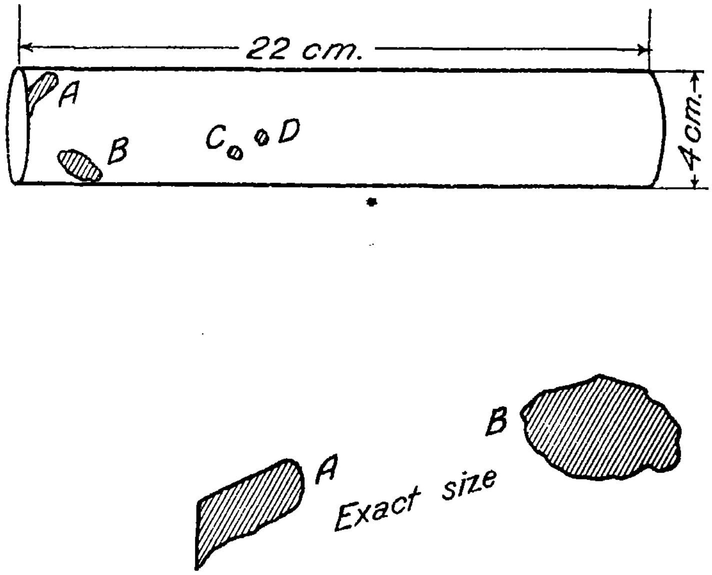

FIGURE 1

Precipitation from air in moist-labile equilibrium,[1] *by A. Refsdal, Geofysiske Publ. 5. 12, pp. 1–71, 1930.*—Air is stated to be in labile equilibrium when its temperature gradient lies between 1.0 and 3.41° C./100 m., while the expression "feuchtlabile" is used for the case where equilibrium is stable for unsaturated but labile for saturated air masses, a condition which frequently occurs. In the "feuchtlabile" region the temperature gradient decreases rapidly with temperature and it occurs more frequently in summer than winter and nearer the surface than above. In the subsequent treatment the author considers: (1) The conditions for stability in the atmosphere; (2) the linear arrangement of local rain and thundery squalls using aerological evidence as indications of fronts in the upper air, the existence of superadiabatic gradients, and applications of the theory to actual weather charts; (3) the "feuchtlabile" night rain is tested by observations at As, and two series of charts; (4) action of local topography; (5) "feuchtlabile" equilibrium and cyclonic activity are considered in two series of charts and the effects of waves and vortices applied; (6) the theory of cyclones is applied to the cases arising in tropical λ, polar and temperate latitudes; (7) the determination of the vertical acceleration and friction for air masses; and (8) the relation of the precipitation to the semidiurnal wave of pressure.—*R. S. R.*

Polish Meteorological Institute Annual for 1928.—The Polish Annual for 1928, which has just appeared, is much

[1] Reprinted from Science Abstracts, vol. 33:894.

more extensive than that for 1927, and we are promised an early publication of the 1929 annual, also that for 1926. Annuals for earlier years will be published hereafter at the rate of about two per year. The new annual contains a general discussion in both Polish and French of the net-work of stations and the types of observations. The data for 12 stations are published in extenso by days. Those for 122 stations are fairly complete, while data for rainfall comprise the reports from the 946 remaining stations of the Polish Weather Service. The details concerning locations, exposures, and heights of the 1,080 stations are presented in Polish (pp. 10-124).—*C. F. B.*

The International Meteorological Committee, Prof. E. van Everdingen, President.—The editor has received the following letter from Professor van Everdingen. The letter is self-explanatory.

DEAR SIR: In his footnote and comments to the Statutes of e International Meteorological Organization, Mr. Henry expresses doubts as to the exact date of the creation of this organization.

It certainly may be considered as a kind of puzzle to find out what the exact date was, and also 1873 has certain rights as the year of the first international meteorological congress at Vienna, which created a permanent committee of seven members. But the Copenhagen conference has chosen 1878 as the year in which this permanent committee, meeting at Utrecht in October (non-official, No. 13, p. 18), drew up by-laws for the organization of a conference, nominating a committee, the powers of which end at the next conference. The name International Meteorological Committee was chosen by the Rome conference of 1879 (p. 16 of the English report, official No. 36).

It is true that the name "organization" was chosen officially only in 1919, but the organization existed long before, exactly in the way as described by Mr. Henry in his last sentences on page 156. It is strange therefore that he should identify on page 155 the organization with the committee, which is only one of its parts. As this mistake occurs frequently with persons not familiar with our meetings, I have thought it worthwhile to draw attention to it when appearing in so prominent a place.

(Signed) E. VAN EVERDINGEN,
President, International Meteorological Committee.

End of the 1930 drought in the Potomac Basin.—A substantial rain of 0.94 inch in 24 hours fell on December 26-27, 1930, and this rain probably marked the termination of the severe drought that has persisted in Atlantic seaboard States for about one year. The rainfall at Washington, D. C., for 1930 up to the end of the year was deficient 20.50 inches, or 51 per cent of the normal annual precipitation.—*A. J. H.*

Climatological summary for Chile, October, 1930 (by J. Bustos Navarrete, Observatorio del Salto, Santiago, Chile).—Intensification in the atmospheric circulation over the Pacific Ocean was accompanied by a return of unsettled weather, depressions being mapped during the periods 2d-4th, 12th-13th, 21st-23d, 24th, and 27th-28th. Anticyclonic conditions marked the following periods: 1st-3d, 5th-7th, 7th-10th, 14th-16th, 19th-21st, and 28th-30th. Unsettled weather and rain abated at the close of the month.

The most notable feature of the month was the violent electrical storm at Santiago on the evening of the 13th.—*Translated by W. W. R.*

BIBLIOGRAPHY

C. FITZHUGH TALMAN, in charge of Library

RECENT ADDITIONS

The following have been selected from among the titles of books recently received as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies:

Alippi, Tito.
La previsione del tempo. Bologna. [1930.] viii, 165 p. figs. plates. 24 cm.

Friedrich, Wilhelm.
Die Messung der Verdunstung vom Mittellandkanal bei Sehnde in den Jahren 1925 bis 1927. Berlin. 1930. 51 p. illus. 35 cm. (Jahrb. für die Gewässer. Norddeutsch. Bes. Mitt. Bd. 6, Nr. 1.)

Glasspoole, John.
Areas covered by intense and widespread falls of rain. With an abstract of the discussion upon the paper. Ed. by H. H. Jeffcott. London. 1930. p. 137-194. figs. 21½ cm. (Exc.: Minutes of proc. Inst. civil engin. v. 229. sess. 1929-1930. pt. 1.)

International geodetic and geophysical union.
Photographic atlas of auroral forms and scheme for visual observations of aurorae. Oslo. 1930. 24 p. plates. 30 cm.

Knoch, Karl.
Klima und Klimaschwankungen. Leipzig. 1930. 150 p. figs. 18½ cm. (Wissenschaft und Bildung. 269.)

Marmer, H. A.
Gulf stream and its problems. Washington. 1930. p. 285-307. figs. 25 cm. (Smith. rep., 1929.)

Mathias, E.
La foudre, ses différentes formes—la matière fulminante. no. 1-5. Paris. n. d. figs. 24½ cm. (Extr.: Annales des postes, télég. et téléph. Nov. 1927; juil. 1928: août, oct., déc. 1929.)
Monographie de l'éclair fulgurant. Compléments relatifs à ses formes terminales. Paris. 1930. 117 p. figs. plates. 24 cm. (Bull. de l'Inst. et observ. de phys. du globe du Puy-de-Dome. no. 2. 1930.)
Remarques sur la pression électrostatique des foudres sphériques. Paris. n. d. 7 p. 24 cm. (Extr.: Annales des postes, télég., et téléph. (Avril 1930.))

Russia. Hydro-meteorological section.
. . . Album of ice forms. Leningrad. 1930. 16 p. plates. 17½ cm. [Author, title and text in Russian and English.]

Sarasola, Simon.
Ley fundamental de la circulacion ciclonica a diversas alturas. [Habana. 1930.] 2 sheets. 50½ cm. (Bol. hidrog. Habana. no. 99-100. Feb. 10, 25, 1930.)
Movimientos del mar en los ciclones. Su importancia en la revision . . . [Habana. 1930.] 2 sheets. 50½ cm. (Bol. hidrog. Habana. no. 102-103. Mar. 25, Abr. 10, 1930.)

SOLAR OBSERVATIONS

SOLAR AND SKY RADIATION MEASUREMENTS DURING NOVEMBER, 1930

By HERBERT H. KIMBALL

For reference to descriptions of instruments and exposures, and an account of the method of obtaining and reducing the measurements, the reader is referred to this volume of the REVIEW, page 26.

Table 1 shows that solar radiation intensities averaged above the normal intensity for November at Washington, D. C., and slightly below normal at Madison, Wis., and Lincoln, Nebr.

Table 2 shows an excess in the total solar radiation received on a horizontal surface directly from the sun and diffusely from the sky at Madison, Lincoln, Chicago, Twin Falls and La Jolla, and a deficiency at Washington, New York, and Fresno.

Skylight polarization measurements were obtained at Washington on November 6 only and give a percentage of 52. At Madison, measurements obtained on 4 days give a mean of 62 per cent and a maximum of 68 per cent on the 22d. The values for both stations are considerably below the corresponding November averages for the respective stations.